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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/755,497	01/05/2001	Michael A. Komara	6785-128	5233

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SACCO & ASSOCIATES, PA
P.O. BOX 30999
PALM BEACH GARDENS, FL 33420-0999

EXAMINER	
CRAVER, CHARLES R	
ART UNIT	**PAPER NUMBER**
2682	

DATE MAILED: 02/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/755,497	KOMARA ET AL.	
	Examiner	Art Unit	
	Charles R Craver	2682	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 August 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *19-26* is/are allowed.

6)☒ Claim(s) *1-7 and 9-18* is/are rejected.

7)☒ Claim(s) *8* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 January 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-7 and 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wessel et al in view of Shaw, both of record, and Aitkenhead, US Pat 5,493,695, of record.

Claim 1: Wessel discloses a wideband transceiver (col 1 lines 45-55 and 66-col 2 line 3) for a base station (col 5 lines 20-22) in a cellular system which communicates with a number of subscribers, including equalization means comprising

inherently, assigning a number of transmit/receive carriers to the wideband receiver, and

modifying the response of the wideband transceiver using amplitude pre-distortion (col 6 line 35-col 7 line 12), the pre-distorting means using memory (col 7 line 66-col 8 line 8), and thus inherently software.

Wessel fails to disclose flattening the spectral power of the carrier frequencies, or that each frequency corresponds to a channel.

Shaw discloses an analogous art, that is, means for modifying the response of a transceiver by using pre-distortion (col 2 lines 3-34), and further using said pre-distortion and filtering to flatten the spectral response power (col 4 line 22-col 5 line 18).

Aitkenhead discloses that pre-distortion is beneficial along with feed-forward designs to linearize the wideband amplifier (col 4 lines 20-42) in a system wherein a number of frequencies may correspond to a number of channels (col 3 lines 25-34).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to add such features to Wessel; Wessel discloses the utility of linearizing the transceiver's behavior, while Shaw discloses the same utility, adding that flattening the power aids in lowering noise. Adding the flattening of Shaw would thus further better the response of the transceiver of Wessel, and Aitkenhead discloses that such pre-distortion is useful in a system where a frequency corresponds with a channel. **Claim 2:** the flattening of the combined invention of Wessel in view of Shaw and Aitkenhead would inherently flatten each carrier and provide an output level for a respective input level. **Claim 3:** Wessel discloses that the pre-distorting means applies coefficients to the wideband signal (col 4 lines 1-9), and that the pre-distortion compensates for the effects of several circuits in the system, including a DAC (col 8 lines 9-32). **Claims 4 and 5:** although Wessel in view of Shaw and Aitkenhead fails to disclose ripple and filter roll-off distortion, one of ordinary skill in the art at the time of the invention would have recognized that such types of distortion may have been present in the output signal of Wessel in view of Shaw and Aitkenhead, and as such would have been a part of the correction signal (Wessel, element 54) and thus compensated for. Note especially that Wessel discloses roll-off-type distortion as a problem, see col 5 lines 61-67. **Claims 6 and 7:** Wessel discloses that the coefficients are determined by taking measurements of the wideband signal automatically (col 9 lines 26-61), which

reads an ABRFTT, and is functionally equivalent to making piecemeal measurements of the wideband spectrum. **Claims 9 and 10:** Wessel discloses storing the coefficients in a memory, specifically in a look-up table (col 9 line 62-col 1 line 3), inherently allowing the interchangability of transceivers. **Claim 11:** Wessel discloses gain coefficients, which would set gains for the entire spectrum.

Claims 12-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Appel, US Pat 6,223,056 in view of Wessel, Shaw and Aitkenhead.

Claim 12: Appel discloses a CDMA (wideband) transceiver for a base station in a cellular system which communicates with a number of subscribers, comprising

receiver (202) coupled to a plurality of digitized receiver signals inherently from A/D conversion, and a transmitter (203) coupled to an analog signal from a multi-channel signal combiner (col 6 lines 4-18), inherently using D/A conversion, including

a number of DSP's for modifying the response of the wideband transceiver using software amplitude modification (col 6 lines 19-49).

Appel fails to disclose flattening the power of the carrier frequencies using pre-distortion, or that a frequency may correspond to a channel.

Wessel discloses an analogous art, that is, means for modifying the response of a CDMA wideband transceiver for linearity (col 6 line 35-col 7 line 12, col 7 line 66-col 8 line 8), wherein software pre-distortion is preferably utilized to correct the response of the wideband transceiver (col 1 lines 45-65 and col 2 lines 15-20).

Shaw discloses an analogous art, that is, means for modifying the response of a transceiver by using pre-distortion (col 2 lines 3-34), and further using said pre-distortion and filtering to flatten the spectral response power (col 4 line 22-col 5 line 18).

Aitkenhead discloses that pre-distortion is beneficial along with feed-forward designs to linearize the wideband amplifier (col 4 lines 20-42) in a system wherein a number of frequencies may correspond to a number of channels (col 3 lines 25-34).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to add such features to Appel; Wessel discloses the utility of linearizing the transceiver's behavior using pre-distortion, while Shaw discloses the same utility, adding that flattening the power aids in lowering noise, and Aitkenhead discloses that such a system benefits a single-channel system. Adding the flattening of Shaw would thus further better the response of the transceiver of Appel. **Claim 13:** although Appel in view of Wessel, Shaw and Aitkenhead fails to disclose ripple and filter roll-off distortion, one of ordinary skill in the art at the time of the invention would have recognized that such types of distortion may have been present in the output signal of Appel in view of Wessel, Shaw and Aitkenhead, and as such would have been a part of the correction signal (Wessel, element 54) and thus compensated for. Note especially that Wessel discloses roll-off-type distortion as a problem, see col 5 lines 61-67. **Claim 15:** Wessel discloses that the pre-distorting means applies coefficients to the wideband signal (col 4 lines 1-9), and that the pre-distortion compensates for the effects of several circuits in the system, including a DAC (col 8 lines 9-32). **Claim 15:** Appel further discloses a transceiver processor (215) connected to a memory (220), and Wessel

discloses storing the coefficients in a memory, specifically in a look-up table (col 9 line 62-col 1 line 3) and gain coefficients, which would set gains for the entire spectrum.

Claim 16: to one of ordinary skill in the art at the time of the invention, it would have been an obvious use of the transceiver of Appel in view of Wessel, Shaw and Aitkenhead to apply it to a repeater for the purposes of extending cellular system range.

Claim 17: Appel discloses a CDMA (wideband) transceiver for a base station in a cellular system which communicates with a number of subscribers, comprising transceiving means including

a receiver (202) coupled to a plurality of digitized receiver signals inherently from A/D conversion, and a transmitter (203) coupled to an analog signal from a multi-channel signal combiner (col 6 lines 4-18), inherently using D/A conversion, including

a number of DSP's for modifying the response of the wideband transceiver using software amplitude modification (col 6 lines 19-49).

Appel fails to disclose flattening the power of the carrier frequencies using pre-distortion, or that a frequency may correspond to a channel.

Wessel discloses an analogous art, that is, means for modifying the response of a CDMA wideband transceiver for linearity (col 6 line 35-col 7 line 12, col 7 line 66-col 8 line 8), wherein software pre-distortion is preferably utilized to correct the response of the wideband transceiver (col 1 lines 45-65 and col 2 lines 15-20).

Shaw discloses an analogous art, that is, means for modifying the response of a transceiver by using pre-distortion (col 2 lines 3-34), and further using said pre-distortion and filtering to flatten the spectral response power (col 4 line 22-col 5 line 18).

Aitkenhead discloses that pre-distortion is beneficial along with feed-forward designs to linearize the wideband amplifier (col 4 lines 20-42) in a system wherein a number of frequencies may correspond to a number of channels (col 3 lines 25-34).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to add such features to Appel; Wessel discloses the utility of linearizing the transceiver's behavior using pre-distortion, while Shaw discloses the same utility, adding that flattening the power aids in lowering noise, and Aitkenhead discloses that such a system benefits a single-channel system. Adding the flattening of Shaw would thus further better the response of the transceiver of Appel. Lastly, given that Appel discloses a cellular system, a number of Base Station transceivers would be inherent. **Claim 18:** to one of ordinary skill in the art at the time of the invention, it would have been an obvious use of the transceiver of Appel in view of Wessel, Shaw and Aitkenhead to apply it to a repeater for the purposes of extending cellular system range.

Allowable Subject Matter

Claims 19-26 are allowed.

Claim 8 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Claim 8 teaches towards a method for flattening output power in a base station wideband transceiver using pre-distortion, wherein ripple and filter roll-off distortion are compensated for by making IF measurements and wideband step-through channel measurements automatically to determine 25 narrowband pre-distortion coefficients for a 5 MHZ IF bandwidth and 300 wideband coefficients for a 60 MHZ RF bandwidth having 200 kHz channels.

Claims 19 and 23 teach towards a method and system for flattening output power in a base station wideband transceiver using pre-distortion, including storage of a generic set of coefficients representative of amplitude distortions from A/D conversions, and a set of specific coefficients specific to a given transcevier, and equalizing an amplitude response of the tranceiver at a number of transmit and receive frequencies within a selected segment using the two sets of coefficients.

Response to Arguments

Applicant's arguments filed 8-16-04 have been fully considered but they are not persuasive.

As to the correspondence of channels and frequencies, see the new ground of rejection above. As to the combination of Wessel and Shaw, Wessel clearly discloses the use of software pre-distortion in a wideband RF system. Shaw merely discloses the utility of flattening the power spectrum in a pre-distortion system; the use of Shaw in a landline system nonwithstanding, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary

reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). Flattening the power spectrum in a system like Wessel would thus include at least a number of channels.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

Or faxed to:

(703) 872-9306 for both formal and informal/draft communications, labeled as such.

Hand delivered responses should be brought to Crystal Plaza II, 200 South 20th St, first floor (receptionist).

Any inquiry concerning this or earlier communications from the examiner should be directed to examiner Charles Craver at (703) 305-3965.

If attempts to reach the examiner are unsuccessful, the examiner's supervisor, Vivian Chin, can be reached at (703) 308-6739.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist at (703) 305-4700.

CC

C.Craver

February 7, 2005

2/7/05
CHARLES CRAVER
PRIMARY EXAMINER